Minerals

Mineral is naturally occurring, inorganic solid with a specific chemical composition and a definite crystalline structure.

Crystal: solid in which atoms are CUBIC a = b = c $\alpha = \beta = \gamma = 90^{\circ}$ arranged in repeating patterns. TETRAGONAL a=b≠c Minerals can form from the $\alpha = \beta = \gamma = 90^{\circ}$ cooling of magma. ORTHORHOMBIC a≠b≠c $\alpha = \overline{\beta} = \gamma = 90^{\circ}$ Magma: molten material found **HEXAGONAL** TRIGONAL a=b≠c beneath the Earth. a=b=c $\alpha = \beta = 90^{\circ}$ $\alpha = \beta = \gamma \neq 90^{\circ}$ γ = 120° MONOCLINIC Vast majority of minerals are Fypes of Unit Cell P = Primitive a≠b≠c $\alpha = \gamma = 90^{\circ}$ made up of eight most common I = Body-Centred β **≠** 120° F = Face-Centred elements. TRICLINIC 7 Crystal Classes a≠b≠c 14 Bravais Lattices α ≠ β ≠ γ ≠ 90° Silicates: make up 96% of 50 minerals and contain oxygen and silicon.

Carbonates: composed of a metallic element with the carbonate compound $(CO_{3}).$

Oxides: compounds of oxygen and a metal.



= Side-Centred

The Eight Most Common Elements

Identifying Minerals

Color: one of most noticeable characteristics. Caused by presence of trace elements.

Luster: the way that a mineral reflects light (i.e.: how shinny it is). Described as either metallic (e.g.: silver, gold) or non-metallic (sulfur, quartz).

Texture: describes how mineral feels to the touch (e.g.: smooth, rough, greasy, soapy and glassy).

Streak: is the color of a mineral when it is broken up and powdered. Mineral rubbed across a porcelain plate with sometimes leave a streak (e.g.: pyrite leaves a greenish-black) streak.

Hardness: is a measure of	MINERAL	HARDNESS	COMMON TESTS
he scratched Mohs	Talc	1	Scratched by fingernail
hardness scale 1-10. Talc	Gypsum	2	
(easily scratched) is a 1			
on Mohs, while a	Calcite	3	Scratched by copper coin
diamond is very hard to			
scratch is a 10.	Fluorite	4	Scratched by a knife blade
Cleavage: measure of	Apatite	5	or window glass
how easily and evenly a	Feldspar	6	Scratches a knife blade or window glass
mineral splits along a flat	Quartz	7	
plane.	Topaz	8	
	Corundum	9	
Fracture: minerals that break with rough or jagged edges.	Diamond	10	Scratches all common materials

Density: d = m / v (e.g.: pyrite has a density of 5.2 g/cm³ and gold has density of 19.0 g/cm³).